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Claims

- [1] A distance measurement method using ultrasonic, comprising the steps of:
transmitting an ultrasonic pulse having specific frequencies to each object;
receiving the ultrasonic pulse that is reflected from the object or directly transmitted; and
extracting a specific frequency of the received ultrasonic wave pulse to find an arrival time of a first pulse and converting the time into a distance.
- [2] The distance measurement method as claimed in claim 1, wherein the step of finding the arrival time and converting the time into the distance further includes the step of separating a specific frequency of the ultrasonic and converting an arrival time of an ultrasonic that is received for the first time among the separated ultrasonic into the distance, in a state where the waveform is mixed with noise having different frequency properties from the specific frequency of the transmitted ultrasonic.
- [3] The distance measurement method as claimed in claim 1 or 2, wherein in the step of converting the time into the distance, the extraction of the specific frequency from the received ultrasonic further comprises the steps of:
amplifying the received ultrasonic to generate an amplified signal;
weakening a signal of an unnecessary frequency among the amplified signal through an analog filter circuit to generate a filtered signal;
amplifying the filtered signal again to generate a re-amplified signal;
converting the re-amplified signal into a digital signal; and
extracting a specific frequency from the converted digital signal through a digital signal processing.
- [4] The distance measurement method as claimed in claim 3, further comprising the step of specifying a distance range to be excluded when measuring a distance of the object, such that a distance exceeding the specified distance range is measured
- [5] The distance measurement method as claimed in claim 1, wherein the step of receiving the ultrasonic reflected from the object while the object is moving comprises changing a received frequency depending on variation of the frequency of the transmitted ultrasonic.
- [6] A distance measurement method using ultrasonic, comprising the steps of:
installing a first receiver for receiving an ultrasonic at a known position;

installing a second receiver for receiving an ultrasonic at an object to be measured;
transmitting an ultrasonic having a specific frequency from a location where a distance from the object will be measured, to the first and second receivers;
extracting specific frequencies of the ultrasonic received from the first and second receivers to find an arrival time of a first signal and converting the time into a distance;
transmitting error information related to a difference between the distance received by the first receiver and the known distance to the second receiver; and
allowing the second receiver to correct the velocity of sound using the error information.

- [7] A distance measurement device using ultrasonic, comprising:
a transmitter for generating an ultrasonic having a specific frequency;
a sensor for detecting the ultrasonic reflected from an object;
an amplifier for amplifying the ultrasonic detected by the sensor;
an analog filter for selectively attenuating other frequencies except for a specific frequency from the ultrasonic amplified by the amplifier;
a secondary amplifier for amplifying an analog signal selected through the analog filter;
an A/D converter for converting the amplified analog signal to a digital data;
a memory for storing the digital data therein;
a digital signal processor for processing the digital data stored in the memory;
an output unit for displaying results processed in the digital signal processor;
a numerical input unit for informing the digital signal processor of a processing condition; and
a communication unit for connecting the digital signal processor and an external apparatus to each other so that the digital signal processor and the external apparatus can exchange information,
wherein a transmission time of a first signal among the received ultrasonic and a delayed time of an arrival time of the first signal calculated in the digital signal processor are measured